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The isolation of the two substances — the reducing and the oxidizing — was now attempted. The former is not changed by boiling or by the action of chloroform, and is soluble in alcohol; the latter is destroyed by heat, is unchanged by chloroform, is insoluble in alcohol, and can be extracted from the triturated cells by water. A large number of root-tips of *Vicia faba* were first rubbed up with water until no fragments remained. The aqueous extract was filtered, and to the filtrate alcohol was added. A precipitate was formed which had all the properties of the oxidizing substance. It is highly probable that it belongs to the category of oxidation ferments. To get the reducing substance, the preceding solution was filtered to eliminate the alcoholic precipitate. The filtrate had all the properties of the reducing substance. A further study indicated that it belonged to the aromatic organic substances, many of which have an intense reducing action, and are hence used in photography.

Thus, geotropic stimulation of the root-tip produces chemical changes leading to the increase of a reducing substance of aromatic nature, and to a diminution in the amount of an oxidizing ferment.

Dissimilar Reciprocal Crosses. — It has been observed in many cases that the two hybrids A♀ × B♂ and B♀ × A♂ are dissimilar. In the current Heft of the *Jenaische Zeitschrift* is an interesting note by the late Fitz Müller-Desterro, serving to explain this phenomenon in a single case, the hybrid of *Ruellia formosa* and *R. silvaccola*. The parent flowers differ in that those of *R. formosa* are a dark, luminous red, while those of *R. silvaccola* are a clear, faint red. The hybrid *R. silvaccola*♀ × *formosa*♂ is of a beautiful red, more like the red of *R. formosa* than of *R. silvaccola;* and *R. formosa*♀ × *silvaccola*♂ is of a cloudy mixed color, with more or less extensive smutty blotches. The difference of color is due to the fact that the egg cell only, and not the male cell, transmits the chromatophores upon which the color depends; hence, the hybrid *R. silvaccola*♀ × *formosa*♂ received chromatophores from *silvaccola* only, while *formosa*♀ × *silvaccola*♂ received them from *formosa* only. (This result does not, however, fully explain the observed facts of color in the hybrid.) The important conclusion is now drawn that in this case the qualities of the hybrid depend, not alone on the germ plasm in a strict sense, but also on certain living included particles.

Scientific Agriculture. — One of the most handy books of reference which has appeared of late is Henry's *Feeds and Feeding.*[1]

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[1] Henry, W. A. *Feeds and Feeding.* A handbook for the student and stockman. Madison, Wis., 1898. Published by the author. 8vo, vi + 657 pp.

Professor Henry, who is one of the ablest and most influential Experiment Station Directors in the country, treats his subject under three headings, dealing respectively with plant growth and animal nutrition, feeding-stuffs, and feeding farm animals. From his own large experience, and the voluminous literature of the Experiment Stations, he has compiled in a readily accessible but condensed form much information concerning the transmutations which organic matter undergoes from its origin in the leaves of plants to its return to the soil as vegetable or animal refuse. T.

ZOOLOGY.

The Sea Otter. — Among North American mammals doomed to practical extermination must be included the sea otter (*Latax lutris*), unless the most rigid restrictions be speedily enforced for its preservation. Formerly this animal was more or less abundant along nearly the whole Pacific coast of North America, from the Pribilof and Aleutian Islands south to northern Lower California. Indeed, the islands of southern California and northern Lower California were, about the beginning of the present century, famous hunting grounds for the sea otter. Another portion of the seaboard where great numbers were killed was the coast of Oregon and Washington, where many were taken as late as 1876. Thence northward, also, to the Aleutian Islands they were killed in large numbers for many years. Only small remnants here and there, however, at present exist along this whole stretch of coast, their extermination, from a commercial point of view, having long since been accomplished. Even in Alaskan waters, during the last half of the eighteenth century, their indiscriminate slaughter had so far reduced their numbers that toward the close of this period the then newly formed Russian American Company placed restrictions upon the number allowed to be taken, and enforced other regulations by which the females were spared, and care insured against needlessly alarming these exceedingly timid and suspicious animals. The early wholesale, unrestricted destruction of the sea otter exactly parallels that of the fur seals throughout their range, except where accorded government protection, and with the same sad result of practical extinction.

Their numbers have now become so alarmingly reduced, even in their last stronghold, the Aleutian Islands, notwithstanding attempted government restriction, that more serious measures for